# Adverse Effects of Pesticides on Human Health

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Pesticides are substances used to control pests and diseases which destroy crops in the field and grains during storage. About 20-30% foods get destroyed by these. So pesticides have become an indispensible input. Pesticides can enter the human body through inhalation of aerosols, dusts and vapours that contain pesticides through oral exposure by consuming food and water and through dermal exposure by direct contact of pesticide with skin.

Pesticide may cause acute and delayed affects in workers who are exposed. Farm workers and their families experience the greatest exposure to agricultural pesticide through direct contact with the chemicals. Children are more susceptible and sensitive to pesticide because they are still developing and have a weaker immune system than adults.

Pesticide exposure can cause a variety of adverse health effects, ranging from simple irritation of the skin and eyes to more severe neurological effects such as memory loss, loss of coordination, reduced visual ability etc. Other possible health effects include asthma, allergies and hypersensitivity, cancer, hormone disruption and problems related with reproduction and fatal development. Other adverse effect can be categorised as:

**A. Neurological effects**

Pesticides like oragnophosphates, carbamates and some fungicides are neurotoxins and associated with effects on central and peripheral nervous system of animals and humans. When people are exposed to these neurotoxins, they may feel dizzy, confused, reduced coordination and ability to think. These are short term effects. Long term exposure can result in reduced IQ and learning disability, associated with permanent brain damage. Pesticide exposure has also resulted in neurodegenerative disorders such as Parkinson's disease in occupationally exposed person, particularly farmer and gardeners.

**B. Reproductive effects**

There is elevated risk of reproductive or development effects from direct exposure to some pesticides prior to conception or during prenatal or postnatal period.

Some pesticides have caused fertility problems and increased risk of spontaneous abortion and miscarriage.

Maternal exposure to pesticide used in gardening during early pregnancy has resulted in increased risk of certain birth defects such as cleft lip and palate.

**C. Carcinogenic and immune system effects**

Some pesticides do change in immune system function (immune toxicity) in animals and humans. A compromised immune system may increase the susceptibility to infectious disease. It may also contribute to development of some cancers. Some studies have shown increased risk of testicular, prostate and cervical cancers and multiple myeloma among those exposed to pesticides through their work. Certain childhood cancers are found associated with parental exposure to pesticides. Pre-conception, prenatal and early childhood exposure to pesticides is associated with childhood brain tumours, leukemia and neuroblastoma. The use of pesticides in home appears to increase the risks of developing these cancers, 2,4-D, a widely used phenoxy herbicide causes cancer.

**Effect of pesticide residue**

Pesticide residue may be defined as any substance or a mixture of substances in foods, agricultural commodities or animal feeds resulting from the use of pesticides. Pesticides being toxic in nature leave behind their residues when used for pest control. The harmful residues of the pesticides that persists in food commodities and environment have been a cause of concern to everybody. The problem of pesticide residue is more in fruits and vegetables due to their increased and frequent use all throughout the fruiting stage even close to harvest as well as post-harvest application during ripening, transportation and storage. Almost all food materials including cereals, pulses, vegetables, fruits, human diets, honey, milk and milk products and vegetable oils. In a survey

conducted by ICMR 51% of our food commodities were found contaminated with pesticide residue and out of these 20% had residue above maximum residue limit (MRT). To control the pesticides residues to minimum level following precautions can be taken:

- Pesticides should be used only when it is absolutely essential. Non-chemical methods should be encouraged.
- Only recommended pesticides should be applied at right time and at prescribed dose.
- Preference should be given to the use of less persistent pesticides.
- Ripe fruit and vegetables should be plucked before pesticide application.
- After pesticide use, the produce should be harvested only after recommended waiting period.
- Pesticide residues on fruits or vegetables can also be reduced by washing with water followed by rubbing and peeling.

**Effect on non-target organisms**

Bee toxicity: Indiscriminate use of insecticides on field crops has resulted in widespread mortality of honeybees and wild bees which are essential for pollination in crops.

Natural enemies: Parasitoids and predators regulate the population of most insect pests. Unfortunately, many natural enemies are susceptible to a variety of pesticides used in crop production. It results in pest resurgence and outbreak of secondary pests in the treated crop.

Fishes: Pesticides that runoff treated crop and often drain into nearby ecosystem (streams and lakes) and can be highly lethal to fishes and other aquatic biota. Even low concentration pesticide in water may eliminate essential fish foods like insects and other invertebrates. Sub-lethal doses of pesticides may increase susceptibility of fish to disease, starvation and other environmental stress.

Higher concentration may kill fish directly. Insecticides are more toxic to aquatic life than herbicides and fungicides. Application of herbicides to water bodies can kill off plants on which fish depend for their habitat.

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